Point/Nonpoint Effluent Trading with Spatial Heterogeneity

Jussi Lankoski[1)], Erik Lichtenberg and Markku Ollikainen[3)]

[1)]OECD, Trade and Agriculture Directorate, 2, rue André-Pascal 75775 Paris CEDEX 16, jussi.lankoski@oecd.org.
[3]University of Helsinki, Department of Economics and Management,P.O. Box 27, FIN-00014, University of Helsinki,markku.ollikainen@helsinki.fi

Tiivistelmä
We examine the implications of spatial heterogeneity for point/nonpoint effluent trading using a theoretical model of a watershed in which a network of tributaries drains into a single receptor body of water when the damage from nutrient pollution varies across locations. We show that it is optimal to adjust trading ratios for both marginal environmental damage and degradation/retention of the pollutant occurring between any pair of locations. We use data from the Kymi River Valley in Finland to examine likely point/nonpoint trading patterns empirically under two different permit allocation schemes. Farmers are the greatest suppliers of permits but gains from trading vary substantially. Farmers growing fertilizer intensive crops on high quality soils are the principal permit sellers and primary beneficiaries of trading; revenue from permit sales may actually allow them to benefit from stricter environmental regulation. Farmers growing crops with low fertilizer intensity on poor soils benefit relatively little when permits are allocated equally and may become net buyers of permits and net losers from regulation under permit allocation schemes that give point sources credit for past regulatory. The benefits of effluent trading are distributed unevenly among point sources as well, with small municipalities being the greatest beneficiaries.